

I CLAIM:

1. A hand controlled regulator adapted to be connected to a resistance-providing device through a string, said hand controlled regulator comprising:

5 a casing;

 an elongated rotatable member that is mounted rotatably on said casing, that defines a rotation axis, and that is operable to rotate about said rotation axis; and

10 a sliding carriage that is mounted movably on said casing, that is adapted to be connected to a connecting end of the string, and that engages said rotatable member in such a manner that rotation of said rotatable member results in a linear movement of said sliding carriage in an axial direction that is parallel to said rotation axis, which, in turn, results in a linear movement of the connecting end of the string in said axial direction.

15 2. The hand controlled regulator as defined in Claim 1, wherein said rotatable member is a screw rod, said sliding carriage including a movable carriage part that is formed with an inner thread engaging threadedly said screw rod, and a stationary carriage part disposed securely in said casing and associated with said movable carriage part in such 20 a manner as to limit co-rotation of said movable carriage part with said screw rod.

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3. The hand controlled regulator as defined in Claim 2, wherein said stationary carriage part has a contact face, said movable carriage part having an abutment face that slidably abuts against said contact face of said stationary carriage part so as to limit co-rotation of said movable carriage part with said screw rod.
4. The hand controlled regulator as defined in Claim 2, wherein said screw rod is a multiple-thread screw rod.
5. The hand controlled regulator as defined in Claim 2, further comprising a hand operating mechanism that engages said screw rod, and that includes a driving gear rotatably mounted in said casing adjacent to said screw rod, and a driven pinion mounted securely and coaxially on said screw rod and meshing with said driving gear.
6. The hand controlled regulator as defined in Claim 5, wherein said casing is formed with a side opening, said hand operating mechanism further including a lever that extends outwardly from said driving gear through said side opening in said casing so as to facilitate turning of said driving gear.
7. The hand controlled regulator as defined in Claim 2, further comprising a hand operating mechanism that engages said screw rod, and that includes a first friction wheel mounted rotatably in said

casing adjacent to said screw rod, and a second friction wheel mounted securely and coaxially on said screw rod and engaging frictionally said first friction wheel, and a turning knob mounted on said casing and connected coaxially to said first friction wheel, said first friction wheel having a diameter greater than that of said second friction wheel.

5 8. The hand controlled regulator as defined in Claim 2, further comprising a hand operating mechanism that engages said screw rod and that includes a first pulley rotatably mounted in said casing adjacent to said screw rod, and a second pulley mounted securely and coaxially on said screw rod, a friction belt trained over said first and second pulleys, and a turning knob mounted on said casing and connected coaxially to said first pulley, said first pulley having a diameter greater than that of said second pulley.

10 15 20 25 9. The hand controlled regulator as defined in Claim 2, further comprising a hand operating mechanism that engages said screw rod, and that includes a first grooved wheel mounted rotatably in said casing adjacent to said screw rod, and a second grooved wheel mounted securely and coaxially on said screw rod, a beaded chain trained over said first and second grooved wheels, and a turning knob

mounted on said casing and connected coaxially to said first grooved wheel, said first grooved wheel having a diameter greater than that of said second grooved wheel.

5 10. The hand controlled regulator as defined in Claim 2, wherein said casing is formed with a side opening, said hand controlled regulator further comprising a hand operating mechanism that engages said screw rod, and that includes a rack-and-pinion assembly 10 having a pinion mounted securely and coaxially on said screw rod, a rack-holding member disposed in said casing and formed with a rack-guiding track extending in a direction transverse to said rotation axis, a rack member disposed slidably in said rack-guiding track and meshing with said pinion, and an operating lever connected to said rack member and extending outward therefrom through said side opening in said casing.

15 11. A hand controlled regulator adapted to be connected to a resistance-providing device through a string, said hand controlled regulator comprising:

20 a casing;

25 a screw rod that is mounted rotatably on said casing, that defines a rotation axis, and that is operable to rotate about said rotation axis;

a sliding carriage that is adapted to be

connected to an end of the string, and that is formed with an inner thread engaging said screw rod; and
a hand operating mechanism that engages said
screw rod, and that includes a driving member
5 mounted in said casing, and a driven member mounted
coaxially on said screw rod and engaging with said
driving member so as to co-rotate with said driving
member;

10 wherein, the speed ratio of said driven member
to said driving member is greater than one so as to
permit linear and accelerated movement of said
sliding carriage.

12. A hand controlled regulator adapted to be
connected to a resistance-providing device through
15 a string, said hand controlled regulator
comprising:

a casing formed with a side opening;
a screw rod that is mounted on said casing, that
defines a rotation axis, and that is operable to
20 rotate about said rotation axis;

a sliding carriage that is adapted to be
connected to a connecting end of the string, and
that is formed with an inner thread engaging said
screw rod; and

25 a hand operating mechanism that engages said
screw rod and that includes a rack-and-pinion
assembly having a pinion mounted securely and

coaxially on said screw rod, a rack-holding member disposed in said casing and having an upper face formed with a rack-guiding track extending in a direction transverse to said rotation axis, a rack member disposed slidably in said rack-guiding track and meshing with said pinion, and an operating lever connected to said rack member and extending outward therefrom through said side opening in said casing.